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AUTHOR Odasz, Frank
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ABSTRACT

This paper discusses the market for rapidly expanding information technology and the benefits of developing community computer networks. Accessible low-cost community networks allow rural communities to provide specific training and educational opportunities tailored to their needs. However, communities must assess the value of connectivity options rather than be dazzled by technological glitz. Big Sky Telegraph (BST) began in 1988 as a rural telecomputing testbed at Western Montana College, by offering an online course via modem to rural K-12 teachers. BST customized its function and services based on advice from practicing teachers and since then has offered free access and online lessons to all citizens interested in learning the benefits of telecomputing. BST offers many services including six community bulletin board systems; Internet E-mail; Internet self-teaching lessons; rosters of K-12 telecurricular projects; graphics; and free local and global customized databases to serve K-12 education and local citizen entrepreneurship and teleliteracy. Bulletin board systems can serve as cost-effective local networks accessing specific Internet services, as opposed to paying for full Internet connectivity. Barriers to community networking are related to enlightened self-interest versus short-term profit motives, lack of teleliteracy among leadership, fear of technology, citizen teleliteracy development needs, and control of information. This paper concludes that national, regional, and local governments should develop programs for funding grassroots innovations toward developing community networks. (LP)

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ISSUES IN THE DEVELOPMENT OF *COMMUNITY COOPERATIVE NETWORKS*

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Frank Odasz
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

by Frank Odasz franko@bigsky.dillon.mt.us
(edited slightly for an international audience
by Barry Fenn barry@cs.auckland.ac.nz)

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DETERMINE GENUINE NEEDS

Most workers today yearn for a better job and more control over their lives. Many feel imprisoned by their work situations, which are related to what they have learned to do.

For decades there has been the promise that one day low-cost, portable micro-computers linked to global networks would allow creative individuals the opportunity to engage in rewarding work regardless of their location or schedules. Such unprecedented flexibility represents the potential for a new era of economic freedom for workers and would provide a choice of lifestyle, residential location, freedom to travel, and freedom to innovate. Each of us is challenged to discover what we must learn, in order to attain such an ideally flexible vocation.

This promise of individual economic freedom, job satisfaction, and mobility appears almost within reach given today's powerful notebook computers and increasing citizen access to the global Internet. Major corporate investments in this field already total many billions of dollars world-wide. As a result, public interest is rising rapidly in the potential economic benefits of networking.

Important questions have been raised as to whether the corporate and individual visions of the potential benefits of 'information superhighways' are the same, or mutually exclusive. Is economic freedom for individuals the goal of the huge corporate initiatives? Or do they aim to secure billion dollar contracts providing entertainment services rather than services in support of economic development? What needs to be the leading vision for the proposed gigabit-bandwidth networks?

In the 1970's, cable was promised as a new vehicle to provide education to the home. Today, far more shows center around the theme of murder, than of education; corporations make a killing on 'lowest common denominator entertainment' and have sidestepped the educational potential. This pattern risks repetition with top-down implementation of public interactive networks.

Do benefits to individuals motivate any part of the corporate vision? Are there various unsubstantiated assumptions about what the 'obvious benefits' should be? Has anyone actually identified what people need - real benefits for real people? If asked, most people would respond "I need a better job", or "I need more economic freedom".

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Most of our needs are best served by textual, not visual information. Most information that can really make a positive impact on individual's is textual, but must first be finely honed by human resource persons and 'proactive neolibrarians' directly addressing our individually specific needs. The prevailing assumption appears to be that expensive bandwidth with a video emphasis is what citizens need. Emphasis must be placed on the providing motivated human assistance to mentor citizen's access to targeted information proven to be beneficial, not just on the physical connectivity.

Distributed conferencing, combining BBS and Internet communities, has been shown to provide affordable global communications using low-cost, low-tech, high imagination networks. An estimated 20 million people worldwide use electronic bulletin boards (BBSes), compared with 10 million people using the Internet. The genesis for how economic freedom can become a reality for workers appears to be coming from the bottom-up, not the top-down.

Grassroots innovations are demonstrating more potential for truly beneficial interactive networks than the expensive, self-serving visions of the corporate giants. Finding ways to provide technical support and funding for grassroots innovations is necessary to provide the diversity of validated applications needed for a successful transition over to equitable participation in a forthcoming 'Global Village'.

It is time to declare a 'Mission for Citizen Teleliteracy centered on Community Networks for Individual and National Competitiveness'. The biggest Internet-related issues are 'How can ubiquitous access be achieved, and what are the real benefits for real people'.

BOTTOM UP MEETS TOP DOWN:

Despite over 60,000 electronic bulletin board systems already operating in the US alone, minimal governmental or corporate support has been demonstrated for the proliferation of these versatile systems in communities. The advocacy for the very real benefits that community telecomputing has demonstrated has come from the bottom-up, not from the top-down. People benefit, but corporate consciousness has not perceived a profit in the 'here today' practical use of available hardware, software and common phonelines. Grassroots innovators have predominantly had to do for themselves what common sense dictates we should be done on a national basis

The ability to glean specific information rapidly from global sources, and to work collaboratively with others to mold that information into entrepreneurial opportunities through global niche markets, appear to be the key skills required for success in the emerging global infogathering society. The Internet will accelerate the evolution of an electronically connected global economy.

Distributed corporations use electronic communications to coordinate manufacturing, management and marketing across connected offices in multiple countries. Global niche markets become accessible even to individual entrepreneurs. Small manufacturers have the option to co-contract with other manufacturers and to co-market products with unprecedented flexibility. The emerging telepreneurial potential is limitless.

Communities are beginning to realize they need to take a proactive stance toward raising local awareness as to the opportunities made possible through telecomputing. Individuals can now purchase direct Internet access for fairly reasonable fees. Citizens would be foolish to wait for the government or the private sector to inform them about the many opportunities inherent in the available connectivity.

Locally accessible low-cost community networks allow any community to provide specific training opportunities for its citizens targeted toward community strengths. Each community must take practical steps to assure their citizens become aware of maximum available benefits of connectivity at minimal cost. In contrast, training provided by the government would not be likely to have a local focus or necessarily reflect a budget-sensitive approach.

With low-end jobs disappearing, we can't afford to leave anyone behind as developed economies shift toward becoming information-based. As networking becomes the highway to commute to work, we need to assure everyone finds the means to travel.

What is the Information Age equivalent of a job flipping burgers? A job changing backup disks? Will we all be able to obtain the skills to share in the promise of ideal employment? Or do we risk a majority of our society facing inevitable unemployment and increasing anger at an elite class of gold-collar information workers who enjoy a disproportionate share of wealth and opportunities? These disenfranchised masses are not likely to be appeased by 500 TV channels to their homes.

COMPETITION VS. COLLABORATION

As the rate of change increases, success depends more and more on an individual's ability to learn steadily, and to make decisions based on up-to-date information. Perhaps we are moving toward an age of independent individuals in ruthless competition with each other on a global basis, with most people ignorant of how to compete. This is one lonely vision of our individual futures. This spectre of individuals and nations trying to out-learn and out-innovate each other may, or may not, be extreme.

Consider another scenario: The competition of the Industrial Age is giving way to Information Age collaboration as a strategy for success. While the key to success in the Industrial Age was to control and protect knowledge, the key to success in the emerging Information Age may be the ability to partner with those who represent sources of continually expanding expertise beyond one's own area of specialty. The ability to access sources of highly specific expertise and to manufacture this knowledge into unique information products and courses of action is likely to be key to future commercial success for individuals as well as businesses.

Perhaps those who collaborate best to share information with others will be the most successful entrepreneurs and bottom-up innovations through telepreneurship will become a key national resource, developable worldwide. The Internet offers extreme entrepreneurial opportunities in the global infomarketplace to individuals able to combine telecommunications skills with their entrepreneurial spirit. Those nations first able

to establish a high degree of citizen teleliteracy may well become the new global economic leaders.

Emerging entrepreneurial 'virtual' communities will not be restricted to national or ethnic boundaries. We're entering an age that allows for an unprecedented new form of human community, based on social, economic and informational interdependency.

Information overload is increasingly real for most of us. Very few of us are able to remain disconnected from the increasing pace of modern life. Information becomes obsolete ever more rapidly. None of us can keep up on all arenas of activity, but each of us does keep up on at least a few circles of activity and expertise. We need to learn how to partner with others who know more than we do, both within and outside our local communities, in return for sharing our own particular expertise and support.

REDEFINING AND REBUILDING OUR COMMUNITIES

In a slower, perhaps more humane era, our communities were based on purpose. The baker provided the baked goods, the blacksmith worked the steel, the butcher prepared the meat, and everyone needed each other. Today, with the supermarket across the street from the dry- goods discounter, we don't experience interdependence as we once did. We often don't know our next-door neighbors. We often don't have an identifiable reason to maintain a sense of community. Our schedules are so intense that community socializing is becoming a rarity. Many of us literally don't belong to any community. We've lost our sense of place, of belonging. Because this is a vital human need, many are rediscovering a sense of purposeful belonging through online communities.

History often repeats itself. Communities have in the past been formed to meet needs as a group we cannot meet as individuals. Group protection from marauding animals or enemies is being replaced by group protection from the assaults of constant change and too much information. As information networking begins to enter mainstream society, each of us has specific areas of interest, and suffers from the increasing pressure of information overload. We're finding we have a new purpose, a genuine need, for re-establishing a support community. We're finding we need to ask those with the expertise "What is it I really need to know about telecommuting, the Internet, electronic access to government services, online distance learning, telepreneurship, and using my computer to get a better job?"

VALUE BANDWIDTH VS VOLUME BANDWIDTH

The question arises of 'value-pull versus tech-push'. Many technologies are being sold as solutions before having proved their benefits to citizens. We need to assess the value of the connectivity options rather than being bedazzled by the technological glitz.

What is the true economic development value to an individual, or a community, of these 'top-down' and 'bottom-up' networking models? Do we need really need hundreds of

pages per second, or would five pages per minute suffice? Value bandwidth is more important than volume bandwidth. It should not be assumed that faster transmission technologies will automatically result in increased access to higher value information. The highest value information is typically condensed information and may not require more than the simplest of transmission technologies.

Information condenses to knowledge, which condenses to wisdom, and economic value is added through this process. The highest-value information would be so condensed as to specifically not require much bandwidth. Given this premise, what does an individual really need to be successful in the Information Age? Perhaps the highest-value service would be e-mail access to supportive expertise able to provide condensed information and training targeted for our highly specific individual needs. Such highest-value services require a definite person-to-person connection. Equity of access to these humanly mentored services must be assured.

RELATIONSHIP-RICH VS RELATIONSHIP-POOR

Urban isolation can be every bit as real as rural isolation. Networking makes it possible to be 'relationship-rich' even in a situation where one might be physically isolated. Those isolated individuals without access to supportive online communities are likely to continue to be 'relationship-poor'.

It is already technically feasible for each individual to begin to grow a private garden of highly specific information gleaned from the Internet, for both personal use and to be sold from a home- based microcomputer as a cottage industry. An online class, taught via modem from the home, on how to establish such a home business could be another enterprise. A community might create a support service for communities attempting to start a community network by providing validating, inspirational stories on models of individual telepreneurial successes and step-by-step lessons on how to bring individual community members online to form a mutually supportive online community network.

Home-based businesses are the fastest growing provider of jobs nationally. Business development incubators need to lead the use of technology in establishing home-based businesses, instead of trailing the trend. Perhaps telepreneurship is destined to prove a bottom-up phenomena, an individually liberating technology, with the centralized top-down efforts likely to be forever trailing the diversity of the grassroots innovations.

Purposeful learning friendships will inevitably become a major means of individual survival as awareness of the benefits of community networking becomes widespread. Just as physical safety was increased by forming friendships in the past, so will our informational safety be increased by similar friendships, or partnerships, in the future. Technology is pushing us to compensate its potentially dehumanizing influences by seeking out the socially reinforcing mechanisms of online communities. Everyone has the potential to be simultaneously a student and teacher in a much more flexible familial context than our current punitive, rigidly structured educational system.

Two themes emerge:

- No one is as smart as all of us.
- No one is too old or too young to learn or to teach.

Networking, by its very nature, leads away from rigid stratified structures and toward informal lateral socially supportive learning partnerships. All of us can learn enough to help someone else survive in some capacity. Once this is understood by the good-hearted among us, the incredible power of networked, knowledgeable, caring people taking purposeful collaborative action may begin to effect worldwide change, transcending governments, cultures and religions. Use of the Internet by Amnesty International is but one small example. Daily "Urgent Alerts" go out via Internet to broadcast human rights violations, deliver the addresses of relevant governmental officials of the country involved, and solicit letters of protest from Amnesty International members. Hundreds of political prisoners have been freed because of the pressure of
this global publicity born of citizen's concerns.

PROVEN MODEL FOR CREATING AFFORDABLE LOCAL GLOBAL TELEPORTS

How can membership in a Global Village be fairly implemented? Those who initially receive gigabandwidth services may enjoy disproportionate advantages to all those, perhaps in rural settings, who do not. How can we all move forward together?

The model of a viable ubiquitous scalable national network challenges many prevailing assumptions perpetuated by the grand visions of large corporations. Local electronic bulletin board systems offer a minimal cost network server model to provide store and forward Internet e-mail services, local free access to customized menus containing self-directed training and highest value information specific to the local community, gleaned from the Internet. This 'appropriate and distributed' model is based on the individual's 'bottom-up' perspective of highest value information at a minimum practical cost.

BIG SKY TELEGRAPH (BST)

Big Sky Telegraph began its role as a rural telecomputing testbed in 1988 at Western Montana College, supported by US West, by offering an online course via modem to rural K-12 teachers, many of which were teaching in one and two room rural schools. BST customized its function and services based on advice from practising teachers. BST's action-oriented philosophy has resulted in many innovations, technical, social, and pedagogical.

During the last six years, BST has offered free access and online lessons to all citizens interested in learning the benefits of telecomputing. Over a dozen separate grants have resulted, many of which received by BST's users who were able to utilize BST in original ways for their own purposes.

KEY FEATURES:

- BST's prime goal has been to demonstrate low-cost, low-tech, high imagination scalable networking models.

- BST runs SCO Unix on a 386 PC with 550 Mb hard drive with 8 dialup modems, and an additional 16 ports linked to 90 terminals on the Western Montana College campus, and full Internet connectivity.

- BST has created 6 community bulletin board systems, a few outfitted with Internet e-mail, Internet self-teaching lessons, rosters of K-12 telecurricular projects, NAPLPS graphics, and customized databases to demonstrate free, local, global teleport capabilities for entire communities to serve K12 education, entrepreneurship, and citizen teleliteracy.

- BST's software allows the sharing of Internet newsgroups as Fidonet echo conferences. Online courses may be taught simultaneously via
  1. Long distance dialup to BST
  2. Direct Internet Access to BST
  3. Via free local bulletin board access
  4. Via Autodial Point disks

- BST serves as a Global K-12 Telecurricular Clearinghouse for projects running on all networks we learn of. See the Kidsnet files area. You're invited to upload your projects directly to our list!

- BST serves as a clearinghouse on Community Networking models using free, local, BBS networks for scalable public access to Internet e-mail, (and coming soon: FTP-mail, gopher-mail and WAIS-mail.) BST will soon offer FTP and gopher services. See the Class files area for Community Networking essays and more about BST. Feel free to upload any offerings you might have!

- BST offers an online course "Microcomputer Telecommunications" covering the basics of telecomputing and modem use, on a limited budget, for connection to any of 60,000+ systems nationally. Frank Odasz is a board member of the Consortium for School Networking and chair of the CoSN Curriculum Committee. Frank is specifically interested in collecting and sharing information on telecurricular multi-classroom projects, and in working with others that are actively teaching online.

- BST serves as an action-oriented Rural Telecomputing Testbed, ready to customize and implement innovative ideas, projects, and partnerships!

OPEN ACCESS

You're invited to join our community!
Telnet to 192.231.192.1 or bigsky.bigsky.dillon.mt.us Type BBS at login.
Self-register and explore! Please report access problems to: franko@bigsky.dillon.mt.us
Frank Odasz, Director of BST, Western Montana College 710 S. Atlantic, Dillon, MT 59725
Voice phone: 406-683-7338, Fax: 406-683-7493, Modem: 406-683-7680

SUPPORTING GRASSROOTS INNOVATORS

Cynthia Denton, a teacher in Hobson, MT (Pop. 200), took the online course from Big Sky Telegraph and with BST's assistance established the Russell Country BBS on her home PC. Hobson residents now have free local access to Internet e-mail and lessons, state legislative, weather and travel reports, and interactive conferences from the Internet. Cynthia has created the nation's first Native American Online Computer Art gallery and hosts graphic images of products created in Hobson and on Native American reservations for sale globally. These graphics are viewable via a free telecommunications terminal program also available on the Russell Country Network. VISA/MASTERCARD accepted via e-mail.

Cynthia taught her third-graders keyboarding skills by having them correspond with third graders in Japan and Australia. Her high school students taught students in Kamchatka (formerly part of the USSR), the free enterprise system, in this case how to run a candy sale. The K-12net conferences locally available on her system are exchanged between 300 teacher-run bulletin board systems globally through nightly short automated phonecalls. These same conferences appear as Internet newsgroups, showcasing seamless integration between Internet newsgroups and bulletin board conferences.

Cynthia's third-graders could potentially exchange lists of locally produced goods with third-graders worldwide, and advise their parents about global trade opportunities among small businesses. With minimal expense, a proprietary global trade network, with a high degree of message security, is possible with this 'low-end' technology. The problem is not in the availability of powerful teletools, but in the vision and training for their appropriate use.

Telepreneurship training could start as early as the third grade to teach the concepts and skills students will doubtlessly need to be successful. School-based community networks could provide convenient interaction with the local business community as we all look toward what we need to be teaching our students and citizens about the shifting world of work.

INTERNET CONNECTIVITY OPTIONS

Full Internet access, and the skills necessary to derive verifiable benefit are optimal goals for all learners. For community economic developers and individuals, this translates to access to tangible economic benefits.

Internet access is not an all-or-nothing issue; there are different levels of access and benefit which challenge many of the prevailing assumptions about the cost-benefit ratio. For many Internet users, the key power of the Internet is the connection to other minds; the Internet as a community. Communications with 10 million Internet users, with reliability and convenience, is possible without full Internet access. Internet messages stored on a local BBS for nightly transfer via high-speed modems, can bring e-mail benefits virtually identical to expensive full Internet access.

Even with full Internet connectivity, we must wait for our mail to be read and answered. For the purposes of building global communities of learning or trading based on interacting regularly with experts, the reach of the global Internet is within potential reach for any community member on a shoestring budget. A community's choice of 5,000 Internet discussion groups can be 'echoed' on local BBSes with great economy. Newsletters and listservers on rural and community development are already being shared worldwide. The potential is limited only by imagination, and for this fundamental level of connectivity, costs and bandwidth are virtually non-issues.

For many, the power of the Internet is the ability to instantly search databases and archives, and to obtain direct access to nearly 1.4 million online systems. While this capability has obvious merit, very similar results can be achieved from BBSes because it is possible to store and forward many types of search requests. This means that while there is not immediate interactivity, well-targeted searches can often locate the needed information within twenty-four hours, or less. This is true for use of File Transfer Protocol (FTP), ordering of files and the use of Internet mail to automatically search many different forms of databases using WAIS-mail, gopher-mail, FTP-mail, and more.

Initially, the most efficient searching strategy is to e-mail a librarian with superior searching skills and request that search results, and their interpretation, be sent via e-mail. Many government and public offices could provide more assistance for more citizens through the efficiencies of electronic mail without an increase in staff or funding. For individuals and communities without the option for full Internet access, these options represent very acceptable temporary alternatives compared with the only other economic choice - access to nothing whatsoever.

Careful analysis of how full Internet access is currently used for many commercial applications will show that most needs can be adequately satisfied through the bulletin board store-and-forward model. For those uses requiring direct Internet connection, it is possible to make a simple modem call via long distance lines for a temporary full connection. Alternatively, a BBS can be set to allow a temporary full Internet connection (intermittent SLIP connection) whenever users need such access, without requiring expensive 24-hour full access that may go largely unused while citizens warm up to their teleliteracy training and begin developing their knowledge access skills.

When it becomes more economical for an individual or community to pay for 24-hour Internet access (versus the pay for what you need model), then full Internet access will be warranted. Otherwise, communities should demonstrate to themselves what they really are prepared to fully utilize. The value of 24-hour Internet access must be demonstrated as opposed to intermittent access models.

An assumption prevails that the Internet is self-teaching. In fact, the greater cost of the Internet is not the connection, but the training required to fully benefit. Demonstration of niche uses, such as access to weather satellite photos, generate great excitement but fail to guarantee that users will find the answers to their individual needs. Friendly, responsive, online librarians and mentors will be key to successful implementation of any community network. Existing public and federal employees need to learn how they can utilize the efficiencies of electronic mail to provide this level of responsiveness to citizens. Additional personnel may not be required. Our existing extensive human community infrastructures need to leverage the availability of our joint expertise through public service participation in online interaction.

Community organizations with full Internet access but no bulletin board system, may lack local access to the Internet from homes, and he ability to interact online with the local community. Important as global access may be, it is usually perceived as a poor second to local community interaction. The optimal combination is to have a local BBS as a user-friendly 'front-end' for the Internet.

BBSes HELP INTEGRATE A COMMUNITY

With a BBS, community involvement suddenly becomes possible through local discussion conferences, community-wide e-mail, local posting of 'gems' from the Internet, and distributed conferences. All can be easily shared with other communities and global networks. Self-teaching, or mentored, lessons could be accessible locally for teaching the skills necessary to enjoy increasing benefits from local and distributed telecomputing and the various levels of Internet access. Menus customized for the local community can provide local 'fingertip' access to the best resources on the Internet.

Additional benefits would be that the community and parents could dial in for school-related information. Student-to-student, student-to-librarian, parent-to-teacher, or student-to-teacher communications would be available from the home via local phonecalls. The community outreach potential for schools has many advantages, such as involving community expertise in making K-12 education immediately relevant to real-world community needs. E-mail allows student/community 24 hour interaction, opening doors to many new levels of interaction. Successful K-12 educational reform hinges on linking classroom instruction to relevant problems and issues within the local community. Education need not be confined to 50 minute periods which end at 3:00 pm five days a week.

The more sophisticated the local system, the higher the maintenance costs. While an MS-DOS bulletin board can be tended without a great amount of time or training, this is not presently true of a Unix system.

Ongoing Internet software developments are constantly improving the methods of accessing specific knowledge from the Internet and non-Internet telecomputing systems. An ongoing online community learning program needs to be put in place to continually update the evolving connectivity options through self-teaching lessons available on local community BBSes. Semantics may be playing a role in confusing the real issues of

integrating Internet access with local telecomputing benefits. Let's redefine BBSes as local Network Servers.

LOCAL SERVER NETWORKS ARE THE OPTIMAL MEANS OF PROVIDING FULL INTERNET ACCESS

For most schools and communities the choice is not between distributed bulletin board systems and full Internet access. Both serve different, but related needs, and both are needed to fully empower communities. The optimal Internet access system must include the benefits of bulletin boards as server networks for very practical reasons.

THE ROLE OF DISTRIBUTED BULLETIN BOARD SYSTEMS:

The Internet does not provide many of the advantages of a locally accessible electronic bulletin board. The ability to host local discussion conferences in a menu-driven system designed specifically for the local community requires a local system. Self-teaching lessons, access to local resource persons and librarians, and showcase menus of high-value resources gleaned from the Internet to meet local needs all become possible through a local bulletin board, but would not be available through simply providing access to the global Internet, or other national networks.

Bulletin board software has recently evolved to the point where an increasing number of systems can allow upgrading to full Internet capabilities while retaining the valuable local services and customized user-friendly menu-driven design. Offline readers and automailer disks offer additional ease-of-use options plus serious economies for those limited to long distance access.

Distributed bulletin board systems are not advocated as a substitute for full Internet access, but rather are the logical pathways toward full Internet access. They are initial 'training-wheels' systems for the Internet that will continue to provide an important local support function even after full Internet access is achieved. Valuable skills can be learned from a local bulletin board in preparation for eventual Internet access, such as use of e-mail, uploading and downloading files, distributed conferencing and use of menu-driven and/or graphical knowledge access interfaces. Eighty percent of Internet use is for these forms of communications which do not require live 24-hour realtime access. If full access is required for searching databases, paying by the hour is often far more practical than expensive yearly rates - until the demand can justify the expense.

Each community needs to validate the benefits of both local telecomputing and full Internet access without a great initial expense. Local bulletin boards provide an economical first step that **most** communities can easily take.

There has been much discussion about graphical interfaces vs. menu-driven interfaces. Either interface requires only a couple steps to access a given feature. The bigger issues are really what is the value of the content accessible, and are truly self-teaching skill development lessons readily available.

The global Internet will soon be the commercial information highway for the entire planet. National information highway systems offer the sort of economic potential that railway and highway system brought to isolated communities a century ago. You and your community must assess the benefits against the costs. Successive connectivity models exist.

BENEFITS OF BULLETIN BOARDS AS LOCAL NETWORK SERVERS

Free, local telecomputing can offer your community:

- Free self-teaching online lessons on the advantages of local, national and international telecomputing.
- Local online discussions can provide a public forum for discussion on local issues and serve as a springboard for innovations.
- Local interest groups could request their own online conference(s), to be either open to the public or closed to a defined group.
- Regionally-shared conferences could allow for a community of communities; For example - multiple local economic development organizations could share ideas and successes.
- Nationally-shared conferences could provide for a national tap on local innovations, and provide a link to national innovations, resources and expertise.
- Global economic development trade contacts, and information resources can be showcased and facilitated.

SUMMARY OF SUCCESSIVE INTERNET ACCESS OPTIONS BY COST

(in U.S. $$, ca. 1993)

REGIONAL MODEL

The Big Sky Telegraph is a 386 microcomputer running the Unix operating system with eight incoming phonelines. Anyone can call in and learn the economies of long distance interaction. Prime time rates of 25 cents per minute translate to a nickel per page with transmission rates at 1200 baud. The skills emphasized to minimize the costs of online time are capturing text for offline reading and uploading prewritten messages and documents. A five dollar weekly phone budget can mean over 80 pages of quality text routinely sent and received in a twenty minute session. A 9600 baud modem drops costs to under a penny a page at prime time rates!

Any group or organization can request an online public conference and/or files area. Individual innovations are actively encouraged.

LOCAL MODEL

A "Tinysky" Community network server running on an IBM compatible PC, Macintosh or Apple IIe (with hard disk) can provide an entire community with the option for free local access to whatever information and discussion conferences that community desires. Automated single, nightly phonecalls can exchange whole conferences and single messages with other community systems and the Internet. Such a system can be used for proprietary, encrypted, global trade communications with individuals using a similar local community network. This type of 'seed' system is only the first step in the evolution of more sophisticated networks and technologies, the pace of which will be dictated by economics. A community system is as changeable as a document on an individual's wordprocessor. A community system can become a living electronic journal of a whole community's struggle for identity and success, coauthored daily by the citizens themselves.

STORE AND FORWARD SERVER NETWORKS

All American citizens could benefit from Internet e-mail access in the short term if the community bulletin board model were implemented nationally. The monthly cost for an entire community to use Internet e-mail through Big Sky Telegraph, or selected other providers, would be elsewhere roughly $100. The cost of operating a community BBS is roughly $50 per month per phoneline, and $50 per month for nightly automated calls, plus the cost of the time for a local system operator (4 hours per week).

Installation in a community would cost roughly $3,000 for hardware and software, and $3,000 for initial training of the system operator and local trainers. A monthly budget of $100 for remote technical assistance is recommended. These costs would be the same for both urban and rural communities. (Costs depend on the number of systems being created, and the number of phonelines per system.) An additional nominal charge for the few minutes of Internet access required for message exchange should be added. Each phoneline could accommodate about 1,000 callers accessing the system twice a week, if citizens used 'point disks', since automated calls require only a few minutes of connect time.

Any school or community in the nation could glean from local sources, through an aluminum can drive for example, the nominal funding to create a local bulletin board system with Internet store-and-forward capabilities. Such a system could provide free, local, global Internet e-mail access, and successive self-teaching lessons to lead interested citizens of any age through the concepts, skill development, and online community-building to open the telepreneurship opportunities of the global info-marketplace.

The most cost-effective Internet connection would be e-mail exchange through a local bulletin board system. Through such a system citizens can access self-teaching lessons and experiment with local, regional, and global electronic mail, menu-driven systems, distributed conferences, Internet listservs, conference discussions, question and answer with resource people and enjoy direct database access from CD-ROM databases and

FTP-mail, gopher-mail, WAIS-mail, archie-mail - and potentially Telebase Corporation's natural language query mail for automated searching of 120 databases. Telebase is developing similar user-friendly database systems specifically for economic developers.

OFFLINE READER

A class can line up at the school-based BBS and individually insert their disks to quickly receive all new messages in their selected conferences. Students would then go to their microcomputer workstations to read new messages and write their responses. At the end of the period students would reinsert their disks and the BBS would hold their outgoing correspondence until midnight when it would make the single nightly phonecall to exchange information globally, costing under $50/month. This model could serve an entire community through a public library or office without requiring citizen ownership of computers.

INDIVIDUALIZED AUTOMAILER 'POINT DISKS'

A 'point disk' would be inserted into a PC and a single command given. The disk would initiate an online call, pickup all new messages in selected conferences and send any messages held on the disk. Upon completion of the automated call, the user would read new messages, and respond offline, directly onto the disk, using the ondisk word-processor. Then the initial command would be repeated and messages would be automatically sent.

A 'point disk' allows a user to select one or more conferences listed on the local community network. A few keytaps instruct the point disk to make an automated call, and to exchange messages with the listed conferences.

Through gateway software, Internet listservs and Fidonet conferences can seamlessly be exchanged, including private Internet e-mail, and Fidonet netmail. Almost no new telecommunications skills are required to use the point disk. Even via long distance, the cost for daily use of a point disk would average under one dollar per automated 2-4 minute phonecall during primetime rates.

Potentially any collection of textual or graphical resources could be requested via a message entered into the point disk's wordprocessor. The user would make resource selections from a listing retrieved by the point disk, and the files would appear on the disk after the next automated call. For example; the daily government press releases, presently available on a gopher server on the Internet, could become conveniently accessible through local community networks without requiring citizens to have individual full Internet access. Minimal training and costs are required using point disks, as opposed to the skills and time required to connect to a network and browse for desired information.

'Point disks' can automatically call either the Internet or other local network servers during the middle of the night, when long-distance phone rates are at their lowest; breakfast reading could thus be ready at the kitchen table every morning. Communities of

shared special interests can learn, interact, and grow together, with economy, reliability and convenience, and without restrictions of physical location or schedules. Multiple automailer programs exist providing the opportunity for access to the highest value information with minimal training and expense.

Not everyone wants to be a computer telecommunications whiz, but many people aspire to be writers, teachers, or at least to have their opinions known. "Writing for Social Responsibility" (WiSeR) software programs using point disks can enlist the talents of any community member with almost no training, at absolute minimal expense.

INTERMITTENT INTERNET ACCESS

The lowest cost for full Internet connectivity is roughly $19 per hour, ($16 per hour for standard long distance charges and $3 per hour for Internet fees) for long distance dialup to a system or BBS with full Internet connections. SLIP software for use of specific client software interfaces is another option. Long distance costs can be brought as low as $5 per hour with recent price drops in 800# services. Delphi and Colorado Supernet both offer full Internet for $3 per hour. This option can be cost-effective for limited access for specific purposes, such as accessing Landsat satellite images for a science class.

If an economic development office or an individual from home needs only a few hours per week on Internet, an occasional $19 per hour charge is cheaper than $12,000 per year, the rough price of full connectivity. Capturing information via a high speed modem can bring costs down to under a penny per page for Internet information!

24-HOUR FULL INTERNET

Full Internet connectivity is available to Big Sky Telegraph from our regional Internet provider, Northwestnet, for $17,000/year for a dedicated 56,000 bits per second line, plus a one-time charge of $10,000 for the router and initial connection. A 56 Kb line will adequately meet the needs of most schools and many colleges. Price wars should bring steadily dropping prices. Full Internet is the option of choice, but realistically, if we all had full Internet connections tomorrow, it would take months or even years for most of us to begin to tap the real potential, resulting in a major waste of money for underutilized full access. In addition, as the Internet currently stands, it could not handle the additional load of all 83,000 schools and their communities jumping on the Internet all at once.

The LORA BBS, developed in Italy, runs under the OS/2 operating system and is truly multiuser, allowing full Internet connectivity while retaining the easy maintenance and customizability of a typical BBS. The intermittent SLIP capabilities runable under LORA allow an 'connect as needed' full Internet menu-driven BBS option. LORA will allow whole menu structures to automatically be 'echoed' on multiple systems, allowing centralized development of multiple distributed network servers. Point disks, offline readers and other benefits of BBSes come as part of this integrated, plug and play package.

BST will be demonstrating the practical use of this, and other models of connectivity, in conjunction with the Annenberg/CPB Math and Science project, and US West, thanks to their funding BST's "Reach for the Sky - Rural Science and Math Telecomputing project".

BARRIERS TO COMMUNITY NETWORKING

Community BBSes are already in use in rural areas, and Free-Nets are beginning to proliferate in urban areas. But there are some subtle, but very real, barriers to their widespread adoption.

1. ENLIGHTENED SELF-INTEREST VS SHORT TERM PROFIT MOTIVES
   Who will promote the practical use of community networking? If corporations don't see billion-dollar projects that promise future megaprofits, they may not support community innovation networks. Citizen input to any governmental decision-making is necessary to assure that citizens' best interests are not forgotten national information superhighways take form.

2. LEADERSHIP TELELITERACY
   With the increasing pace of technological advancement, our government and corporate leaders need to stay keenly aware of rapidly evolving low-cost, low-tech, high imagination networking options. Citizens need to assure our leaders stay current in their knowledge as to what practical networking options exist so they are able to lead us intelligently. To date, we have not held our leaders thus accountable as is demonstrated by the incomplete nature of most network-related legislation oblivious of the practical alternatives already functioning at the grassroots level.

3. FEAR OF TECHNOLOGY
   Many people over 30 years of age are not comfortable with the idea of learning computer skills, much less studying networking concepts and telecommunications technologies. We need to assure fearful citizens can receive all the human support necessary for them to become comfortable with the use of computers. Local volunteers need to be encouraged to help citizens through this transitional period.

4. CITIZEN TELELITERACY DEVELOPMENT NEEDS
   - Success stories demonstrating the economic value of connectivity need to be shared broadly.
   - Citizens need free local access and mentored training in use of the online medium - as it's invisible to the uninitiated.
   - Citizens need friendly low-threat opportunities to learn how to draw verifiable benefit from networking.
   - Global telepreneurship training needs to be made available via modem and/or other media to the home.

- Public access computers and community learning centers are needed to help all individuals in all communities prepare for survival in this transitional decade. Loaner laptops are becoming a feasible alternative.
- We need to advocate a national mission for citizen teleliteracy centered on community networking for the national good.
- Testbed models are needed to identify economic models that provide verifiable citizen benefits at an affordable cost while allowing Internet providers to sustain development of value-added Internet access and human mentorship.

6. CONTROL OF INFORMATION

Networking represents a culture shift toward new communications behaviors. Existing management structures are threatened by the lateralization of information access. If control of information represents power, resistance to making information more broadly available is to be expected. Incentives, and ongoing evaluations for strategic partnering among federal, state and local agencies are needed.

Every community stands on four basic legs: education, business, health and government. The tendency has been for each of these separate communities to establish its own networking infrastructures, not connected to the others. These, and other, communities within the greater community need to work together to realize economies of scale and avoid wasteful duplication. Creating a successful strategy on how to achieve successful partnering with the various different communities that make up each 'whole' community is a challenge we all have a stake in.

COMMUNITY NETWORKS BENEFIT NATIONAL GOALS

National, regional and local governments need to develop programs for funding grassroots innovations and sharing, and rewarding, successes.

Community networks can benefit the government by providing the training necessary for citizens to access government information electronically. Local experts can assist the general public in access to information and services through the convenience of e-mail. Those government services most important for a given community can be tailored through customized online menus for enhanced ease of access by the public. A community network can potentially provide a single point of access for both local and national government services, accessible with the help of friendly local online public servants. Government CD-ROM databases can be economically mass-produced and made locally accessible on multiple community networks. Regularly updatable, and potentially tailorable for the needs of specific communities, CD-ROM databases can provide literally gigabytes of government information at very low costs.

IN CONCLUSION -

Community networks, even those based on simple BBS software, can potentially offer citizens individual Internet e-mail IDs; literally global citizenship and telepreneurial passports. Such local networks can now provide citizens self-teaching lessons and affordable arrangenents for effective Internet access.

A country's greatest benefit from community networks will be the national tap on local innovations. Widespread grassroots innovations will be necessary for the potential of electronic delivery of government services to become a reality and for any nation to be an economic success in the forthcoming Information Age.